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SEPARATION OF *d*-*neo*BORNYLAMINE FROM *d*-BORNYLAMINE

BY

J. A. GOODSON

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THE WELLCOME CHEMICAL RESEARCH LABORATORIES
(The Wellcome Foundation Ltd.)
T. A. HENRY, D.Sc., *Director*
6, King Street, Snow Hill
LONDON, E.C. 1

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Separation of d-*Neobornylamine from* d-*Bornylamine.* By JOHN AUGUSTUS GOODSON.

IT has been shown by Forster (J., 1898, **73**, 390) that reduction of *d*-camphoroxime with sodium in boiling amyl alcohol yields a mixture of *cis*- and *trans*-isomerides, distinguished as *d*-bornylamine and *d*-neobornylamine, respectively. The isolation of *d*-neobornylamine from this mixture has presented considerable difficulty (compare Forster and Hart-Smith, J., 1900, **77**, 1152; Pope and Read, J., 1910, **97**, 987; 1913, **103**, 454). Separation of the two amines can be effected in the following way.

A mixture of the two amine hydrochlorides (223 g.), resulting from the reduction of *d*-camphoroxime (290 g.), on recrystallisation from water gave a crop of crystals (77·3 g.). An ethereal solution of the bases from the crystals was shaken consecutively with 500

and 300 c.c. of dilute hydrochloric acid (approx. 0·6*N*), giving solutions 1 and 2. A similar solution of the bases from the mother-liquor was shaken with three quantities of 500 c.c. of the dilute acid, giving solutions 3, 4, and 5. These five preparations were evaporated to dryness, giving the following products :

No.	Weight.	$[\alpha]_D$ in dry alcohol ($c = 4{\cdot}4$).	Bornylamine hydrochloride. Calc.	Neobornylamine hydrochloride. Calc.
1	49·8 g.	+19·1°	46·9 g.	2·9 g.
2	27·5	+12·9	23·6	3·9
3	50·85	+ 3·7	37·15	13·7
4	50·35	− 6·2	29·9	20·45
5	44·5	−22·6	16·6	27·9

Pure *d*-bornylamine hydrochloride was easily obtained from the dextrorotatory fractions by recrystallisation from water as shown by Forster (*loc. cit.*) and Frankland and Barrow (J., 1909, **95**, 2017). The specimen giving the highest rotation had $[\alpha]_D^{20°}$ + 23·3° ($c = 4{\cdot}4$ in dry alcohol), the previous highest value recorded being + 22·7° (Forster, *loc. cit.*). The ethereal solutions of the bases from the lævorotatory fractions were shaken with small quantities of dilute hydrochloric acid until the $[\alpha]_D$ of the hydrochloride of the base remaining in the ethereal solution became constant. *d*-Neobornylamine hydrochloride having $[\alpha]_D^{20°}$ − 49·4° ($c = 4{\cdot}4$ in dry alcohol) was thus obtained, the previous highest value recorded being − 44·2° (Forster and Hart-Smith, *loc. cit.*).—Wellcome Chemical Research Laboratories. [*Received, March 19th*, 1927.]

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